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Nipponomeconema, a New Genus of the Japanese
Meconematinae (Orthoptera, Tettigoniidae),
with the Description of Four New Species

With 28 Text-figures

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ABSTRACT A new genus of the subfamily Meconematinae is erected under the name of *Nipponomeconema*, which is closely related to the European genus *Meconema*, but it differs from the latter in the presence of stridulatory organ on fore wings, longer pronotum, larger number of spines on both the dorsal margins of hind tibia, and undeveloped titillator. Under this new genus, four new species are described from Honshu, viz., *N. musashiense* of the Kantô District, *N. mutsuense* of the Tôhoku District, *N. surugaense* of the vicinity of the Akaishi Mountain Range, and *N. hidaense* of the Province of Hida. They are distinguished from one another by the shape of male cerci and styli, ovipositor, and subgenital plate of both sexes. In addition to these, a short discussion is given on *Meconema subpunctatum* MOTSCHULSKY in relation to the present new genus.

In the course of my study on the Japanese meconematine tettigonids, I came across four new species from Honshu belonging to a new genus. This genus is similar to the European *Meconema* in appearance and, in fact, both the genera have a close sister relationship. It is very important to introduce this new genus into science for tracing the origin of *Meconema* having no stridulatory organ on male fore wings.

In the present paper, I am going to describe the new genus under the name of *Nipponomeconema* and four new species included in the new genus, though the material is not yet sufficient. This is the second paper dealing with the Japanese Meconematinae followed by my 1982 account. The type material is deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo, and some paratypes are preserved in my collection for further study.

Before going further, I wish to express my hearty thanks to Dr. S. ASAHINA for his encouragement during the course of the study. Thanks are also due to Dr. Y. KUROSAWA and Messrs. M. TOMOKUNI and M. OWADA of the National

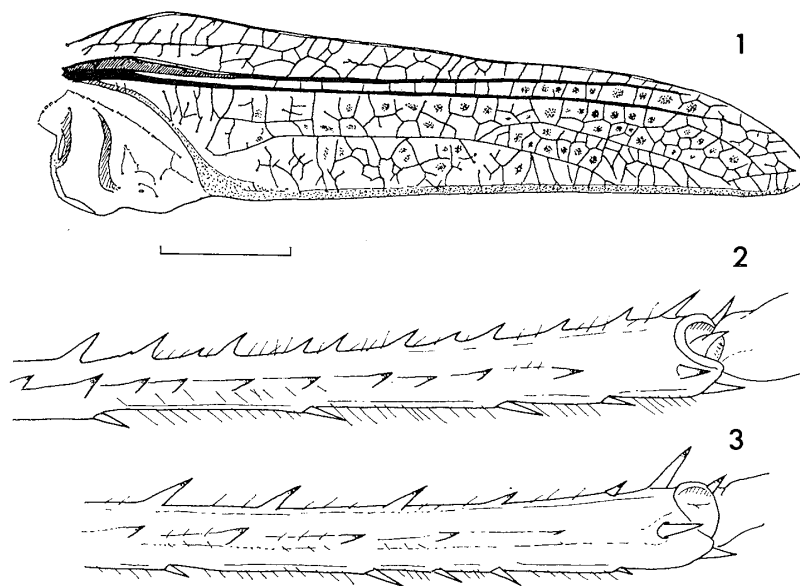
Science Museum (Nat. Hist.), Tokyo, Dr. K. YASUTOMI of the National Institute of Health, Tokyo, and to the late Mr. K. SHIRAHATA for their kind aid in submitting their specimens to me for study.

Genus *Nipponomeconema* YAMASAKI, nov.

Type-species. *Nipponomeconema musashiense* YAMASAKI, sp. nov.

Meconematinae. Small-sized. Macropterous. Closely related to *Meconema*, but the present new genus has usual stridulatory organ on male fore wings.

Head short; fastigium forming fastigial cone which is moderately protruded and with sulcus; apex of cone blunt; occiput smooth and round. Eyes globular, relatively small. Antenna long; first and second segments enlarged. Pronotum smooth and shiny, longer and shallower than that of *Meconema* (Fig. 5), without lateral carinae and humeral sini; anterior margin almost straight and posterior margin semicircularly round; metazona protruded posteriorly (Figs. 6–9) and roundly raised in male, but slightly raised in female, with a weak median carina in posterior half. Lateral foramina of thorax (thoracic auditory spiracles) visible from latero-caudal point in both sexes. Fore wings developed, but not extending beyond hind knees; most part of the male stridulatory organ concealed under metanotum. Hind wings developed; their apices reaching those of fore wings. Tibial auditory structure open, oval. Fore and middle tibiae with three to five, mostly four, pairs of spines ventrally, and with an apical spine externally and internally. Hind femora



Figs. 1–3. Fore wing and hind tibia of *Nipponomeconema* gen. nov. and of *Meconema*. — 1. Male right fore wing of *Nipponomeconema mutsuense* YAMASAKI, sp. nov. — 2–3. Apical third of hind tibia of *Meconema thalassinum* (DE GEER) (2) and of *N. mutsuense* (3), dorsolateral view. Scale, 2 mm for Fig. 1.

long and smooth. Hind tibiae with spines in smaller number (ca. 22) than that in *Meconema* (ca. 25) dorsally (Figs. 2 and 3), with about three pairs of slender spines in apical one-fourth on the ventral surface, and with two apical spines dorsally and ventrally.

Male tenth tergite incurved or with an central emargination on posterior margin. Male cerci long, slender, and more strongly curved than those of *Meconema*, thick in the basal part and excavated in the basal half of inner side; apical half cylindrical and more or less curved dorsally, round at the apices. Male subgenital plate variable in the outline of the posterior margin; styli small. Titillator undeveloped. Female cerci normal, tapering towards apex. Female subgenital plate without the median protrusion possessed by *Meconema*. Ovipositor sword-like, broad and smooth, roundly curved upwards, with a short hook at the apices of ventral valves.

Coloration pale green. Antennae brownish, sometimes with a few dark rings. Occiput sometimes with a pair of black small bands behind both eyes. Disc of pronotum with a pair of small black spot in the subanterior margin and with a pair of brown to dark brown large markings (Figs. 10–13) in metazona. Posterior margin of fore wings, dorsal spines of hind tibiae, and apical portion and ventral margin of ovipositor brownish. Hind wings hyaline; veins pale brown.

Nipponomeconema musashiense YAMASAKI, gen. et sp. nov.

[Japanese name: Musashi-tsuyumushi-modoki]

(Figs. 4, 6, 10, 14, 17, 20, 23 and 27)

Male tenth tergite widely incurved between cerci. Male subgenital plate excised in a V-shape between small styli. Cerci rather short. Ovipositor wider at the basal part.

Length (from apex of fastigium to apices of fore wings): ♂ 12.5–15.1 mm, ♀ 15.3 mm.

Male. Head as shown in Figs. 4 and 10. Pronotum long as shown in Figs. 4, 6 and 10; metazona more strongly raised as compared with female. Fore wings shorter than those of the other species.

Abdominal end as shown in Figs. 14, 17 and 20. Tenth tergite as shown in Fig. 14, widely but shallowly incurved between cerci. Cerci simple as shown in Figs. 14, 17 and 20, long and incurved, and also curved upwards in apical one-third. Subgenital plate as shown in Fig. 17, moderately excised in a V-shape in the posterior margin; styli large and thick for the member of the genus.

Female. Fore wings not extending beyond the middle of ovipositor. Supra-anal plate short, semicircular. Subgenital plate as shown in Fig. 27, subtriangular but round at the apex. Ovipositor as shown in Fig. 23; ventral valves becoming deeper in about basal one-seventh.

Coloration. Same as in the description of the genus.

Measurement (mm). Body length to apices of cerci, ♂ 10.9–13.0 (11.9 in holo-

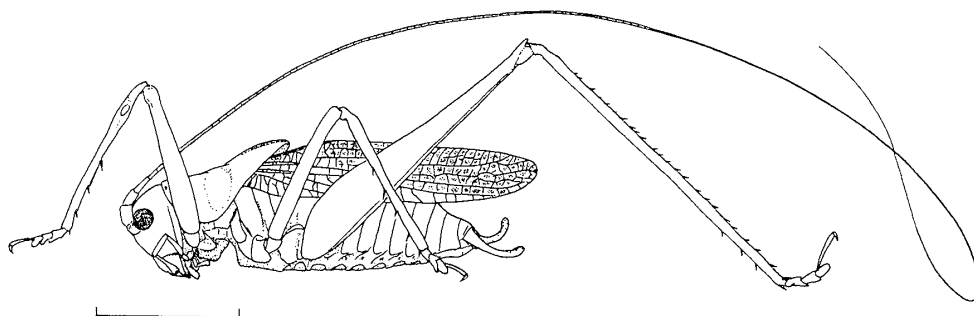


Fig. 4. *Nipponomeconema musashiense* YAMASAKI, gen. et sp. nov., ♂, of Nippara, Okutama, Tokyo. Scale, 3 mm.

type); body length to base of ovipositor, ♀ 11.4; body length to apex of ovipositor, ♀ 19.2; greatest head width, ♂ 2.45–2.5 (2.5), ♀ 2.7; pronotal length, ♂ 4.0–4.4 (4.2), ♀ 4.0; fore wing length, ♂ 9.5–11.8 (11.6), ♀ 11.7; hind femoral length, 9.7–11.6 (10.2), ♀ 11.0; hind tibial length, ♂ 10.4–11.8 (10.9), ♀ 11.9; cercal length, ♂ 2.4–2.8 (2.8); ovipositor length, 7.8.

Type-series. Holotype: ♂, Futase, 560 m, Mt. Mitsumine, Ôtaki-mura, Chichibu, Saitama, 30-x-1981 (T. YAMASAKI). Paratypes (including allotype): 1 ♀ (allotype), Mt. Tenso-zan, 1,500 m, Okutama, Tokyo, 13-viii-1976 (Y. WATANABE); 1 ♂, Nippara, 800 m, Okutama, Tokyo, 21-ix-1976 (Y. KUROSAWA) and 1 ♂, same locality, 21-ix-1976 (M. TOMOKUNI); 1 ♂, Ooimachi, Tokyo, 194? (T. SHINOHARA).

Type-locality. Mt. Mitsumine, Chichibu, Saitama, Honshu, Japan.

Distribution. Known so far only from the Kantô Mountain Area and Tokyo Metropolis.

***Nipponomeconema mitsuense* YAMASAKI, sp. nov.**

[Mutsu-tsuyumushi-modoki]

(Figs. 1, 3, 7, 11, 15, 18, 21, 22 and 26)

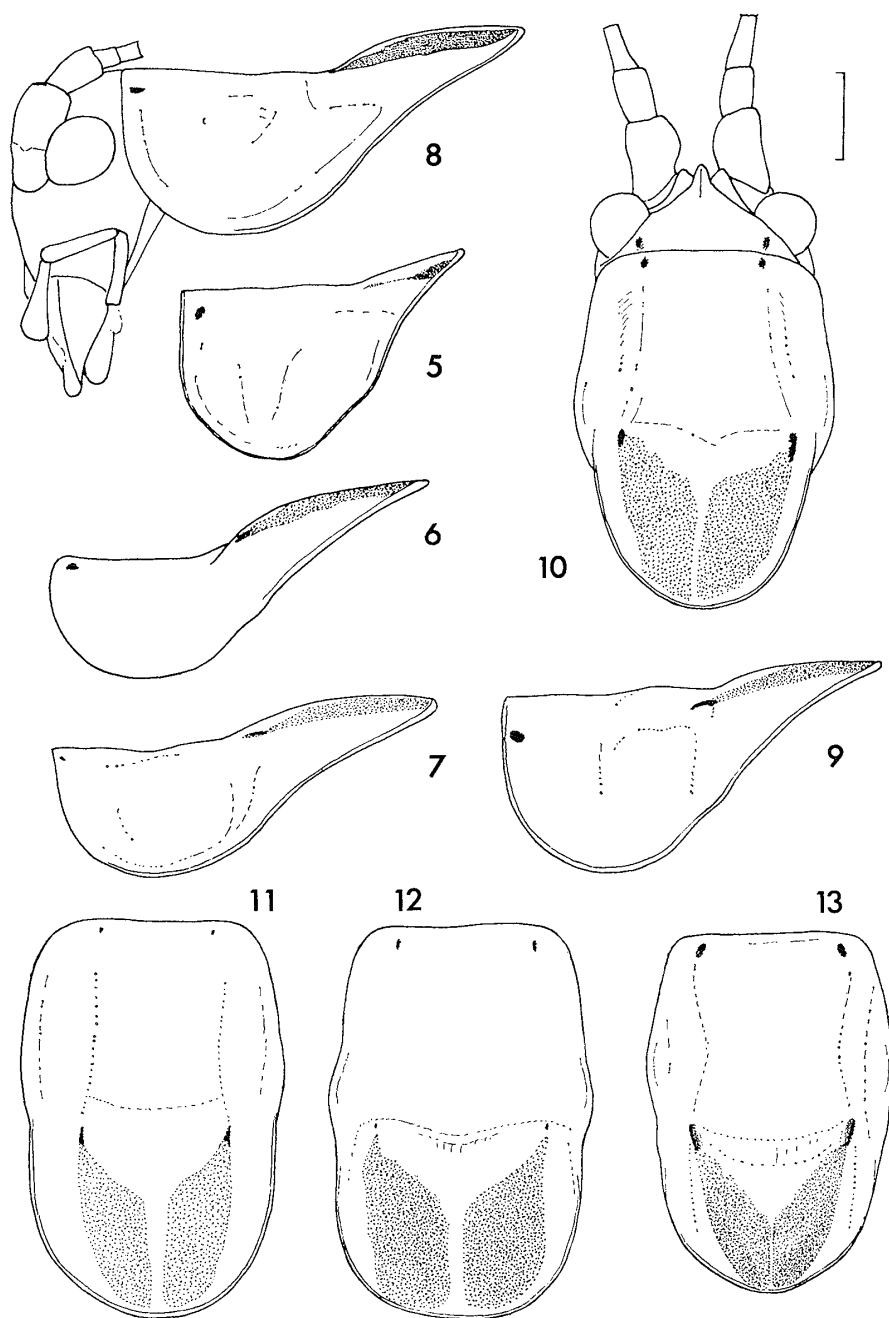
Male tenth tergite shallowly, not widely, incurved between cerci. Male subgenital plate with round posterior margin, styli small. Ovipositor rather slender.

Length (from apex of fastigium to apices of fore wings): ♂ 14.5–15.4 mm, ♀ 17.5–18.5 mm.

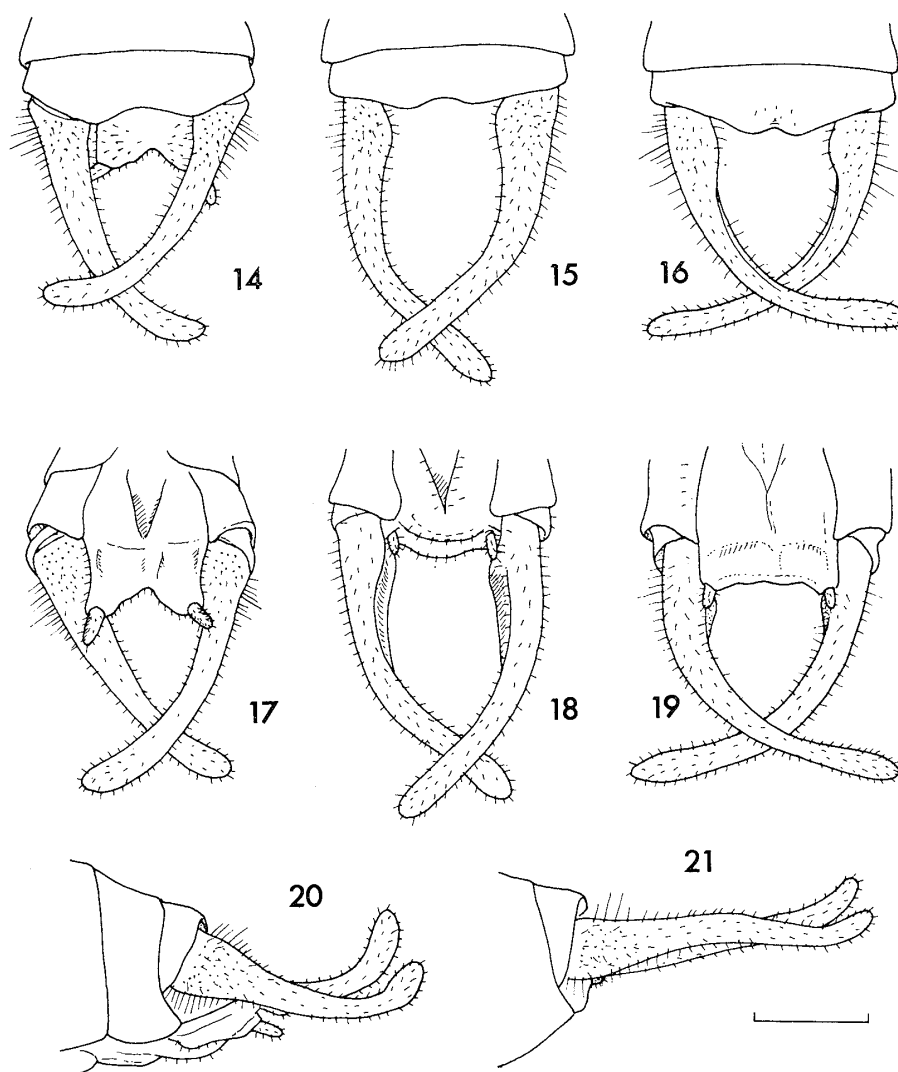
Male. Pronotum almost the same as in the type-species. Venation of fore wing as shown in Fig. 1.

Abdominal end as shown in Figs. 15, 18 and 21. Tenth tergite narrowly and shallowly incurved at the posterior margin. Cerci as shown in Figs. 15, 18 and 21, longer, weakly curved upwards in apical part. Subgenital plate as shown in Fig. 18, gently rounded at the posterior margin; styli small.

Female. Abdominal end as shown in Fig. 22. Supra-anal plate semicircular. Subgenital plate as shown in Fig. 26, being like the shape of spade; apex blunt. Ovipositor as shown in Fig. 22, rather slender at the basal part.



Figs. 5-13. Pronotum of *Meconema* and *Nipponomeconema* gen. nov. — 5. *Meconema thalassinum* (DE GEER), ♀. — 6, 10. *Nipponomeconema musashiense* YAMASAKI, sp. nov., ♂. — 7, 11. *N. mutsuense* YAMASAKI, sp. nov., ♂. — 8, 12. *N. surugaense* YAMASAKI, sp. nov., ♂. — 9, 13. *N. hidaense* YAMASAKI, sp. nov., ♀. — 5-9. Lateral views. — 10-13. Dorsal views. Scale, 1 mm.



Figs. 14–21. Male abdominal end of *Nipponomeconema* gen. nov. — 14, 17, 20. *Nipponomeconema musashiense* YAMASAKI, sp. nov. — 15, 18, 21. *N. mutsuense* YAMASAKI, sp. nov. — 16, 19. *N. surugaense* YAMASAKI, sp. nov. — 14–16. Dorsal views. — 17–19. Ventral views — 20, 21. Lateral views. Scale, 1 mm.

Coloration. Same as in the description of the genus, but variation is observed in the size of markings of pronotum.

Measurements (mm). Body length to apices of cerci, ♂ 11.7–13.0 (12.3 in holotype); body length to base of ovipositor, ♀ 13.2–13.9; body length to apex of ovipositor, ♀ 20.8–21.2; greatest head width, ♂ 2.4–2.5 (2.4), ♀ 2.7–2.9; pronotal length, ♂ 4.3–4.4 (4.3), ♀ 3.9–4.3; fore wing length, ♂ 10.9–11.8 (11.8), ♀ 12.7–14.0; hind tibial length, ♂ 10.5–11.3 (10.5), ♀ 12.5–13.4; cercal length, ♂ 2.9–3.0 (3.0); ovipositor length, 7.7–8.1.

Type-series. Holotype: ♂, Tsuta-onsen, 500 m, Towada-ko, Aomori, 1-x-

1974 (S. ASAHINA). Paratypes (including allotype): 1 ♀ (allotype), Yake-yama, 400 m, Towada-ko, Aomori, 19-viii-1970 (K. YASUTOMI); 1 ♂, Shin-takayu, 1,100 m, Mt. Azuma, Yamagata, 8-x-1970 (K. SHIRAHATA), 1 ♂, same locality, 20-viii-1978 (K. SHIRAHATA), and 1 ♀, same locality, 26-ix-1970 (K. SHIRAHATA); 1 ♂, Okutainai, 350 m, Kurokawa-mura, Niigata, 10-x-1982 (M. TOMOKUNI).

Type-locality. Tsuta-onsen, Towada-ko, Aomori, Honshu, Japan.

Distribution. Known so far only from the Tōhoku District, Honshu.

Nipponomeconema surugaense YAMASAKI, sp. nov.

[Suruga-tsuyumushi-modoki]

(Figs. 8, 12, 16 and 19)

Male tenth tergite with a small and shallow notch at the posterior margin. Male subgenital plate weakly incurved but not deeply excised on the posterior margin. Markings of pronotum wide and dark.

Length (from apex of fastigium to apices of fore wings): ♂ 15.0–16.5 mm.

Male. Head and pronotum as shown in Figs. 8 and 12; pronotum deep and slightly wider than in the other species. Fore wings rather long, reaching subapical portion of hind femora.

Abdominal end as shown in Figs. 16 and 19. Tenth tergite as shown in Fig. 16, with a small notch at the posterior margin. Cerci as shown in Figs. 16 and 19, a little inflated internally at the basal part. Subgenital plate as shown in Fig. 19, weakly incurved but not clearly notched at the posterior margin; styli small.

Female. Unknown.

Coloration. Same as in the description of the genus, but markings of pronotum are wider and darker.

Measurements (mm). Body length to apices of cerci, 11.7–12.9 (12.7 in holotype); greatest head width, 2.5–2.6 (2.5); pronotal length, 4.4–4.5 (4.5); fore wing length, 11.5–12.3 (12.3); hind femoral length, 10.9–11.3 (11.2); hind tibial length, 11.9–12.7 (12.7); cercal length, 2.8–3.1 (2.8).

Type-series. Holotype: ♂, Akaishi-onsen—Hatanagi Reservoir, 850 m, middle course of the River Ōi, Shizuoka, 1-x-1978 (M. TOMOKUNI). Paratypes: 3 ♂, same data as the holotype.

Type-locality. Hatanagi, middle course of the River Ōi, Shizuoka, Honshu, Japan.

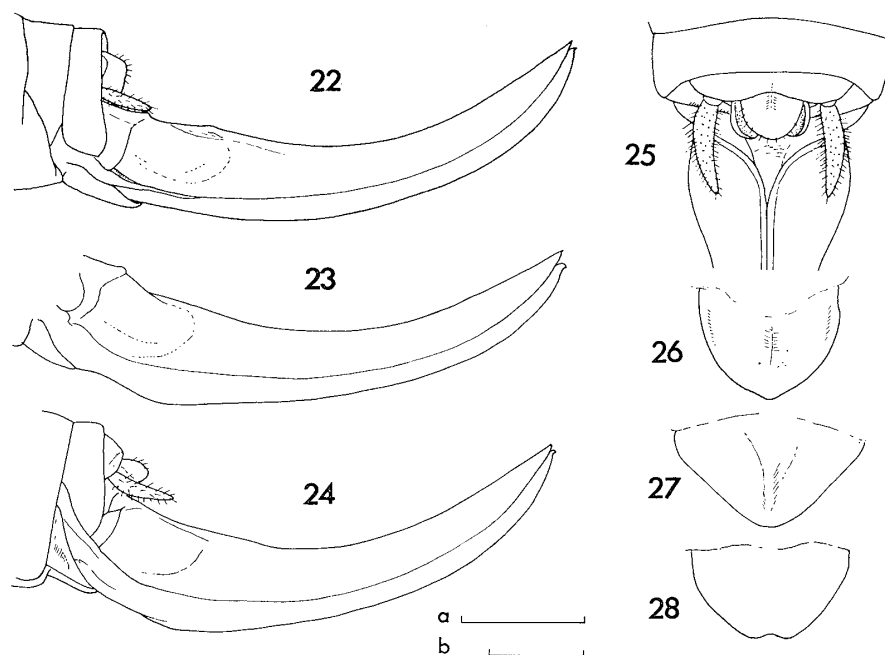
Distribution. Known so far only from the type-locality.

Nipponomeconema hidaense YAMASAKI, sp. nov.

[Hida-tsuyumushi-modoki]

(Figs. 9, 13, 24, 25 and 28)

Known only from female. Distinguished from the first and second species



Figs. 22–28. Female abdominal end (22–25) and subgenital plate (26–28) of *Nipponomeconema* gen. nov. — 22, 26. *Nipponomeconema mutsuense* YAMASAKI, sp. nov. — 23, 27. *N. musashiense* YAMASAKI, sp. nov. — 24, 25, 28. *N. hidaense* YAMASAKI, sp. nov. — 22–24. Lateral views. — 25. Dorsal views. — 26–28. Ventral views. Scale a, 2 mm for Figs. 22–25, and scale b, 1 mm for Figs. 26–28.

by the shape of female subgenital plate, and from the third by the shape of markings of pronotum.

Length (from apex of fastigium to apices of fore wings): ♀ 14.7–15.9 mm.

Male. Unknown.

Female. Pronotum as shown in Figs. 9 and 13. Fore wings reaching the middle of ovipositor.

Abdominal end as shown in Figs. 24 and 25. Supra-anal plate semicircular. Cerci normal. Ovipositor as shown in Fig. 24, widening at the subbasal part. Subgenital plate as shown in Fig. 28, posteriorly narrowing, with distinctly but shallowly rounded notch at the posterior margin.

Coloration. Markings of pronotum become darker posteriorly (Fig. 13).

Measurements (mm). Body length to base of ovipositor, 11.4 (11.4 in holotype); body length to apex of ovipositor, 19.3 (19.3); greatest head width, 2.6–2.7 (2.7); pronotal length, 3.9–4.3 (4.3); fore wing length, 11.2–11.7 (11.7); hind femoral length, 10.2–10.6 (10.6); hind tibial length, 10.9–11.5 (11.5); ovipositor length, 7.5–8.0 (8.0).

Type-series. Holotype: ♀, Hikusui-ko, 1,325 m, Ôshirakawa, Shirakawa-mura, Gifu, 4-x-1982 (M. OWADA). Paratype: 1 ♀, same data as the holotype.

Type-locality. Ôshirakawa, Shirakawa-mura, Gifu, Honshu, Japan.

Distribution. Known so far only from the Province of Hida, Gifu, Honshu.

DISCUSSION

I have already pointed out the diagnostic differences between *Nipponomeconema* and *Meconema* in the preceding chapter, but there are some similarities between them, viz., general appearance, simply shaped male cerci, colour pattern on the disc of pronotum, and the shape of ovipositor. These common or synapomorphic characters show that these two genera have a sister relationship.

From Japan, one *Meconema* species was described, i.e. *M. subpunctatum* MOTSCHULSKY, 1866. It is, however, probable that the species actually belongs to the present new genus, *Nipponomeconema*, since true *Meconema* does not seem to extend its distribution to Japan. The original material of *M. subpunctatum* was based on Mme. GASCHKEVITCH's collection made in Japan. Though MOTSCHULSKY failed to designate its exact locality, it is supposed to have come from Hakodate or its environs, Hokkaido (HASEGAWA, 1976). From the geographical point of view, *N. mutsuense* sp. nov. is distributed in the area adjacent to Hakodate, though the Tsugaru Straits lie between both the areas, and therefore, it may have some direct relationship to MOTSCHULSKY's species. The problem will remain unsolved till the time when someone can re-examine the type-specimen.

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